FAA-STD-048
July 7, 1995

U.S.Department
of Transportation

**Federal Aviation
Administration**

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

STANDARD

NATIONAL AIRSPACE SYSTEM (NAS)

OPEN SYSTEMS INTERCONNECTION (OSI) INTEROPERABILITY STANDARD

FOREWORD

This standard establishes requirements necessary for ensuring that National Airspace Systems (NAS) open systems conforming to Open Systems Interconnection (OSI) requirements specified in FAA-STD-039 are able to interoperate under a variety of operational conditions to provide one or more defined services. The NAS open systems must employ certified implementations of communication protocols that comply with the International Organization for Standardization (ISO) OSI standards as defined in FAA-STD-039.

This standard includes definitions in section 6.1 and is written in accordance with FAA-STD-005.

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APPENDIXES

1. SCOPE

1.1 Scope

This standard provides the requirements for ensuring that peer vendor Open Systems Interconnection (OSI) products conforming to FAA-STD-039 [National Airspace System (NAS) Open Systems Architecture and Protocols] and FAA-STD-047 [NAS Open Systems Conformance Testing] are able to interoperate correctly with each other. The objective is to provide a service which, for a specific protocol (or set of protocols), will test whether two separate implementations are able to interoperate under a variety of operational conditions. For these vendor implementations to interoperate correctly, they must pass all mandatory tests and all relevant optional tests resulting from implementation of the same optional functions. However, for OSI systems connected to non-OSI systems through a gateway this rule does not apply.

OSI products must first undergo conformance testing before they can undergo interoperability testing. Interoperability testing increases the probability that two conformant vendor-supplied OSI products will interoperate. It reduces interoperability problems, such as parameter range selection, attempts to use incompatible stacks, optional functions not implemented, and failures to implement mandatory functions. Passing the interoperability tests guarantees that systems are more likely to interoperate with each other and behave in a consistent manner in representative instances of communications.

NAS systems implementing OSI must employ the same options/services and protocols in order to ensure interoperability.

Interoperability requirements for connectivity of NAS open end systems communicating with the Aeronautical Telecommunication Network (ATN) are not discussed in this document because ATN upper layer requirements are not fully defined. These requirements will be incorporated when the ATN panel has determined those requirements applicable to the NAS. These OSI products must first undergo conformance testing before they can be interoperability tested.

1.2 Purpose

The purpose of this standard is to establish interoperability testing requirements to ensure that NAS open systems (end and intermediate) interoperate with each other.

1.3 Relationship to Other Documents

This document provides requirements for testing the interoperability of conformant vendor implementations of OSI protocols specified in FAA-STD-039. This document is complementary to the conformance testing standard, FAA-STD-047.

2. APPLICABLE DOCUMENTS

The following documents form a part of this standard to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this standard, the contents of this standard shall be considered the superseding requirement.

2.1 Government Documents

FAA Standards

FAA-STD-005d	Preparation of Specification Documents, August 4, 1993
FAA-STD-039a	National Airspace System (NAS) Open Systems Architecture and Protocols, October 27, 1993
FAA-STD-047	National Airspace System (NAS) Open Systems Conformance Testing, December 29, 1993

Federal Standards

NISTIR 4435	GOSIP FTAM Interoperability Test Suite, August 1990
NISTIR 5438	Industry/Government Open Systems Specification (IGOSS) Testing Framework, June 1994
GOSIP PICS Proforma 1	US GOSIP Protocol Implementation Conformance Statement Proforma for Packet Layer (ISO 8208), March 1992
GOSIP PICS Proforma 3	US GOSIP Protocol Implementation Conformance Statement Proforma for Connectionless Network Layer Protocol (ISO 8473), March 1992
GOSIP PICS Proforma 6	US GOSIP Protocol Implementation Conformance Statement Proforma for Transport Class 0 and 4 Protocols (ISO 8073), March 1992

2.2 Non-Government Documents

International Telegraph and Telephone Consultative Committee (CCITT)

CCITT X.25	Interface Between Data Terminal Equipment (DTE) and Data Circuit Terminating Equipment (DCE) for Terminals operating in the Packet Mode on Public Data Networks, 1984

International Organization for Standardization (ISO)

ISO/IEC 8073:1988	Information Processing Systems - Open Systems Interconnection - Connection-Oriented Transport Protocol Specification, 2nd Edition
ISO/IEC 8073:1988/ AD2:1989	Information Processing Systems - Open Systems Interconnection - Connection-Oriented Transport Protocol Specification - Addendum 2: Class Four Operation over Connectionless Network Service
ISO/IEC 8208:1990	Information Technology - Data Communications - X.25 Packet Layer Protocol for Data Terminal Equipment, 2nd Edition
ISO 8327/DAD2	Information Processing Systems - Open Systems Interconnection - Basic Connection-Oriented Session Protocol Specification - Addendum 2: Incorporation of Unlimited User Data, June 1988
CD 8327-2.2	Information Technology - Open Systems Interconnection - Basic Connection-Oriented Session Protocol Specification - Part 2: Protocol Implementation Conformance Statement (PICS) Proforma, September 1991

ISO 8473:1988	Information Processing Systems - Data Communications - Protocol for Providing the Connectionless-Mode Network Service (CLNS), 1st Edition
ISO 8473:1988/ AD3:1989	Information Processing Systems - Data Communications - Protocol for Providing the Connectionless-Mode Network Service - Addendum 3: Provision of the Underlying Service Assumed by ISO 8473 over Subnetworks Which Provide the OSI Data Link Service, 1st Edition
ISO/IEC 8571-4:1988	Information Processing Systems - Open Systems Interconnection - File Transfer, Access, and Management - Part 4: File Protocol Specification, 1st Edition
ISO/IEC 8571-5:1990	Information Technology - Open Systems Interconnection - File Transfer, Access, and Management - Part 5: Protocol Implementation Conformance Statement (PICS) Proforma
ISO/IEC 8571-5:1990/ PDAM1:1992	Information Technology - Open Systems Interconnection - File Transfer, Access, and Management - Part 5: PICS Proforma - Amendment 1: Filestore Management
ISO 8823:1988	Information Processing Systems - Open Systems Interconnection - Connection-Oriented Presentation Protocol Specification, 1st Edition
DIS 8823-2	Information Technology - Open Systems Interconnection - Connection-Oriented Presentation Protocol Specification - Part 2: Protocol Implementation Conformance Statement (PICS) Proforma, June 1990

ISO/IEC 8878:1992	Information Processing Systems - Data Communications - Use of X.25 to Provide the OSI Connection-mode Network Service (CONS), 2nd Edition
ISO/IEC 8880-2:1988	Information Processing Systems - Protocol Combinations to Provide and Support the OSI Network Service - Part 2: Provision and Support of the Connection-Mode Network Service, 1st Edition
ISO/IEC 9041-1:1990	Information technology- Open Systems Interconnection - Virtual Terminal Basic Class Protocol - Part 1: Specification, 1st Edition
ISO/IEC 9041-2:1993	Information technology- Open Systems Interconnection - Basic Class Virtual Terminal Protocol - Part 2: Protocol Implementation Conformance Statement (PICS) Proforma
ISO/IEC 9072-2:1989	Information Processing Systems - Text Communication - Remote Operations - Part 2: Protocol Specification, 1st Edition
ISO/IEC 9542:1988	Information Processing Systems - Telecommunications and Information Exchange Between Systems- End System to intermediate System Routeing Exchange Protocol for Use in Conjunction with the Protocol for Providing the Connectionless-mode Network Service

ISO/IEC 10021-6:1990	Information Technology - Text Communication - Message-Oriented Text Interchange System - Part 6: Protocol Specifications, 1st Edition
ISO/IEC 10021-6:1990/ DAM1:1993	Information Technology - Text Communication - Message-Oriented Text Interchange System - Part 6: Protocol Specifications - Amendment 1: Message Store Extensions and Message Store Logs
DIS 10026-3.2:1991	Information Technology - Open Systems Interconnection - Distributed Transaction Processing - Part 3: Protocol Specification
ISO 10026-3/PDAM1:1994	Information Technology - Open Systems Interconnection - Distributed Transaction Processing - Part 3: Protocol Specification- Amendment 1: Commitment Optimizations
DIS 10026-4:1991	Information Technology - Open Systems Interconnection - Distributed transaction Processing - Part 4: Protocol Implementation Conformance Statement (PICS) Proforma
ISO/IEC 10589:1992	Information Technology - Telecommunication and Information Exchange Between Systems - Intermediate System (IS) to IS Intra-Domain Routeing Information Exchange Protocol for Use in Conjunction With the Protocol for Providing the Connectionless-Mode Network Service (ISO 8473)

ISO/IEC 10747:1993	Information Technology - Telecommunications and Information Exchange Between Systems - Protocol for Exchange of Inter-Domain Routeing Information among Intermediate Systems to Support Forwarding of ISO 8473 PDUs (IDRP)

3 REQUIREMENTS

3.1 General Requirements

NAS open systems shall conform to the OSI standards specified in FAA-STD-039.

This standard shall apply to whatever protocol OSI stack is implemented in accordance with FAA-STD-039.

Conformance testing of these vendor products shall be in accordance with FAA-STD-047. The OSI products shall be conformance tested before interoperability tested. The completed Protocol Implementation Conformant Statement Proforma (known as the PICS) which is used in conformance testing shall also be used for interoperability testing.

Interoperability testing of peer vendor-developed OSI products shall be performed by a testing agency recognized by the National Institute of Standards and Technology (NIST) and shall be in accordance with the testing policies specified in the Industry/Government Open Systems Specification (IGOSS) Testing Framework document, NISTIR 5438. As mandated by NIST, interoperability testing with a Government Open System Interconnection Profile (GOSIP) reference implementation shall be performed when reference implementations exist. The reference implementations must be registered for a specific protocol stack.

Currently, no reference implementations exist. Therefore, Interoperability testing of end systems shall be performed via bilateral agreement between the end system vendors. Interoperability testing of intermediate systems shall be performed via multilateral agreement among the end system vendors. The Interoperability test suites used in interoperability testing shall be registered with the NIST Computer Systems Laboratory (NCSL). Refer to Appendix III for a listing of GOSIP version 2 interoperability test suites and their corresponding protocols.

All products that have successfully completed interoperability testing must be listed in the NIST's register of GOSIP-approved products. This register is known as the U.S. GOSIP Register Database (GORD). Refer to Appendix I for more information on this database and how it can be accessed.

Interoperability testing of vendor-provided commercial-off-the-shelf (COTS) OSI products shall be verified through GOSIP

Interoperability Testing and Registration services. Refer to Appendix II for information on companies that provide these services. The license record (or declaration of interoperability) obtained from the GOSIP Register and unique to each product shall be made available to the FAA so that a determination can be made as to each product's exact scope of interoperability. The license records (or declarations of interoperability) identify the product of each test party, reference relevant profiles (example, GOSIP version 2, X.400), and list the detailed tests that were run, including hardware platform, operating system, and any derived systems. Refer to Appendix IV for a listing of interoperable OSI products.

If a license record (or declaration of interoperability) does not exist for the particular vendor-provided product, then the interoperability test method shall be approved by the Federal Aviation Administration (FAA). This method should provide the FAA with proof of the product's exact scope of interoperability.

COTS products which have been issued certificates by interoperability testing services outside the U.S. shall also be used providing that the interoperability testing services meet certain criteria established by the NIST and are recognized by the NIST.

Currently, there are no OSI interoperability security requirements for NAS systems.

3.2 Interoperability Test Suites

This section contains specific requirements for ensuring interoperability between vendor-supplied OSI implementations.

3.2.1 Application Layer

NAS open end systems may select from several OSI Application Service Elements (ASE) to satisfy particular open end systems requirements. These ASEs include File Transfer, Access and Management (FTAM), Message Handling System (MHS), Transaction Processing (TP), and Virtual Terminal (VT). NAS open systems also use application service elements to provide application layer services common to user applications. Such ASEs include the Association Control Service Element (ACSE) and the Remote Operations Service Element (ROSE). However, ACSE and ROSE are used in conjunction with other ASEs. As a result, there is no specific interoperability test for either ACSE or ROSE.

3.2.1.1 File Transfer, Access and Management (FTAM)

NAS open end systems that require FTAM services implement the FTAM protocol as specified in ISO 8571-4. These FTAM tests are grouped according to the type of system [limited-purpose (LP) or full-purpose (FP) systems] and implementation roles (initiator-sender, responder-receiver, initiator-receiver, or responder-sender). The interoperability tests used to verify the interoperation between vendor-supplied implementations of FTAM shall be based on NISTIR 4435, GOSIP FTAM interoperability Tests. Refer to Appendix A of NISTIR 4435, "FTAM Interoperability Requirements for GOSIP," for the specific set of tests that must be successfully completed by vendor products in order to meet the GOSIP profile requirements specification. Vendor implementations that include FTAM options providing additional functionality shall be verified by using the optional test cases located in NISTIR 4435. Implementors claiming FTAM interoperability shall submit the protocol implementation conformance statement (PICS) of ISO 8571-5 and the Protocol Implementation eXtra Information for Testing (PIXIT) document to an accredited interoperability testing authority.

3.2.1.2 Message Handling System (MHS)

NAS open end systems that require MHS services implement the MHS protocol as specified in ISO 10021-6 and ISO 10021-6/DAM1. The GOSIP profile categorizes these MHS tests as the Send/Receive tests and the Reliable Transfer Service tests. Vendor implementations using independent MHS options that provide additional functionality shall use the MHS optional limitation and Relay tests. Currently, registered interoperability tests used for testing the interoperation between vendor-supplied implementations of MHS (88), the PICS Proforma, and the PIXIT document for MHS (88) do not exist. Therefore, the interoperability test method, PICS Proforma, and PIXIT document shall be submitted to the FAA for approval. Implementors claiming MHS (88) interoperability shall submit the PICS and the PIXIT document to an accredited interoperability testing authority.

3.2.1.3 Transaction Processing (TP)

NAS open end systems that require TP services implement the TP protocol as specified in DIS 10026-3.2. Currently, registered interoperability tests used for testing interoperation between vendor-supplied implementations of TP do not exist. Therefore, the vendor-provided interoperability tests for the TP protocol shall be submitted to the FAA for approval. Implementors

claiming TP interoperability shall submit the PICS of DIS 10026-4 and the PIXIT document to an accredited interoperability testing authority.

3.2.1.4 Virtual Terminal (VT)

NAS open end systems that require VT services implement the VT protocol as specified in ISO 9041-1. For GOSIP, these VT tests are grouped according to the type of system: 1. Simple, 2. Forms-capable. Currently, registered interoperability tests used for testing the interoperation between vendor-supplied implementations of VT do not exist. Therefore, the vendor-provided interoperability tests for the VT protocol shall be submitted to the FAA for approval. Implementors claiming VT interoperability shall submit the PICS of ISO 9041-2 and the PIXIT document to an accredited interoperability testing authority.

3.2.2 Presentation Layer

NAS open end systems that require the presentation service implement the connection-oriented presentation protocol as specified in ISO 8823. Currently, registered interoperability tests used for testing the interoperation between vendor-supplied implementations of the connection-oriented presentation protocol do not exist. Therefore, the vendor-provided interoperability tests for the presentation protocol shall be submitted to the FAA for approval. Implementors claiming connection-oriented presentation protocol interoperability shall submit the PICS of DIS 8823-2 and the PIXIT document to an accredited interoperability testing authority.

3.2.3 Session Layer

NAS open end systems that require the session service implement the connection-oriented session protocol as specified in ISO 8327 and ISO 8327/DAD2. Currently, registered interoperability tests used for testing the interoperation between vendor-supplied implementations of the connection-oriented session protocol do not exist. Therefore, the vendor-provided interoperability tests for the session protocol shall be submitted to the FAA for approval. Implementors claiming connection-oriented session protocol interoperability shall submit the PICS of CD 8327-2.2 and the PIXIT document to an accredited interoperability testing authority.

3.2.4 Transport Layer

NAS open systems that require the connection-oriented transport service implement the connection-oriented transport protocol as specified in ISO 8073 and ISO 8073/AD2. Currently, registered interoperability tests used for testing the interoperation between the vendor-supplied implementations of the connection-oriented transport protocol do not exist. Therefore, the vendor-provided interoperability tests for the connection-oriented transport protocol shall be submitted to the FAA for approval. Implementors claiming connection-oriented transport protocol interoperability shall submit GOSIP version 2 PICS for Transport class 0 and 4 Protocols (ISO 8073) and the PIXIT document to an accredited interoperability testing authority.

3.2.5 Network Layer

3.2.5.1 Connectionless Network Protocol

NAS open end systems that require the connectionless network service implement the connectionless network protocol (CLNP) as specified in ISO 8473 and ISO 8473/AD3. Currently, registered interoperability tests used for testing the interoperation between vendor-supplied implementations of the connectionless protocol do not exist. Therefore, the vendor-provided interoperability tests for the connectionless protocol shall be submitted to the FAA for approval. Implementors claiming connectionless network interoperability shall submit GOSIP version 2 PICS for connectionless network layer protocol (ISO 8473) and the PIXIT document to an accredited interoperability testing authority.

3.2.5.1.1 End System to Intermediate System Routing Protocol

NAS open systems (e.g., end systems and routers) implement the end system to intermediate system (ES-IS) protocol as specified in ISO 9542. Currently, registered interoperability tests used for testing the interoperation between vendor-supplied implementations of the ES-IS protocol do not exist. Therefore, the vendor-provided interoperability tests for the ES-IS protocol shall be submitted to the FAA for approval. Implementors claiming ES-IS protocol interoperability shall submit the PICS of ISO 9542, Annex A, and the PIXIT document to an accredited interoperability testing authority.

3.2.5.1.2 Intermediate System to Intermediate System Intra-Domain Routing Protocol

NAS open intermediate systems (e.g., routers) that provide routing within the NAS implement the intermediate system to intermediate system (IS-IS) protocol as specified in ISO 10589. Currently, registered interoperability tests used for testing the interoperation of two vendor-supplied implementations of IS-IS do not exist. Therefore, the vendor-provided interoperability tests for the IS-IS protocol shall be submitted to the FAA for approval. Implementors claiming IS-IS protocol interoperability shall submit the completed PICS of ISO 10589, Annex A and the PIXIT document to an accredited interoperability testing authority.

3.2.5.1.3 Boundary Intermediate System to Boundary Intermediate System Inter-Domain Routing Protocol

NAS open boundary intermediate systems (e.g., routers) that provide routing within the NAS and to external systems implement the boundary intermediate system to boundary intermediate system (BIS-BIS) protocol as specified in ISO 10747. Currently, registered interoperability tests used for testing the interoperation of two vendor-supplied implementations of BIS-BIS do not exist. Therefore, the vendor-provided interoperability tests for the BIS-BIS protocol shall be submitted to the FAA for approval. Implementors claiming BIS-BIS protocol interoperability shall submit the PICS of ISO 10747, Annex A and the PIXIT document to an accredited interoperability testing authority.

3.2.5.2 Connection-oriented Network Protocol

NAS open end systems that require a network connection when not communicating over intermediary networks and directly connected to a X.25 packet switching network, implement the connection-oriented service (CONS) as specified in ISO 8880-2. Currently, registered interoperability tests for ISO 8880-2 protocol, the PICS Proforma, and the PIXIT document do not exist. Therefore, the vendor-provided interoperability test method, PICS proforma, and PIXIT shall be submitted to the FAA for approval.

NAS open end systems communicating only over a single X.25 network (i.e., no intermediary networks) implement CONS in conjunction with ISO 8208, as specified in ISO 8878. Currently, registered interoperability tests for testing ISO 8878 do not exist. Therefore, the vendor-provided interoperability test

method shall be submitted to the FAA for approval. Implementors claiming ISO 8878 interoperability shall also submit the PICS of ISO 8878 and the PIXIT document to an accredited interoperability testing authority.

3.2.5.3 Subnetwork Access Protocol

Testing of the subnetwork access protocol at the Network Layer shall be as specified in FAA-STD-047, paragraph 3.2.2.2.2.

3.2.6 Data Link Layer

Testing at the Data Link layer shall be as specified in FAA-STD-047, paragraph 3.2.2.3.

3.2.7 Physical Layer

Testing at the Physical layer shall be as specified in FAA-STD-047, paragraph 3.2.2.4.

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4. QUALITY ASSURANCE PROVISIONS

This section is not applicable to this standard.

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5. PREPARATION FOR DELIVERY

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6. NOTES

6.1 Definitions

Declaration of Interoperability: Formal statement of successful testing for interoperability of two products.

End System: An end system contains the application processes that are the ultimate sources and destinations of user-oriented message flows. The functions of an end system can be distributed among more than one processor/computer.

GOSIP Product: A product which implements one or more of the data communications protocols identified in GOSIP and meets the requirements specified herein.

Implementor: A company that builds OSI products.

Intermediate System: A system providing an Open Systems Interconnection - Reference Model Network Layer relay function (that is, a system that receives data from one correspondent Network entity and forwards it to another corresponding Network entity).

Interoperability: The capability of one entity to collaborate with one or more other peer entities to render a particular service to their respective users.

Interoperability Testing: A process where two or more products execute the interoperability test suite according to an interoperability test method.

Interoperability Test Method: An interoperability test method describes the set of actions and associated procedures that guides a real open system through interoperability evaluation, with one or more real peer open systems, in order to evaluate the degree of interoperability achieved by the systems involved.

Interoperability Test Suite: A set of test scripts specified to test compatibility between conforming open systems to demonstrate provision of the application service by each peer.

Implementation Under Test (IUT): An implementation of one or more OSI protocols in an adjacent user/provider relationship, being that part of a real open system which is to be studied by testing.

Open System: An open system is a system capable of communicating with other open systems by virtue of implementing OSI protocols and services. End systems and intermediate systems are open systems. However, an open system may not be accessible by all other open systems. This isolation may be provided by physical separation or by technical capabilities based upon computer and communications security.

Product: A product which implements one or more of the data communications protocols identified in OSI and meets the requirements specified herein. See also GOSIP product.

Protocol Implementation Conformance Statement (PICS): A statement made by the supplier of an OSI implementation, or system, stating which capabilities and options have been implemented for a given OSI protocol.

Protocol Implementation Conformance Statement (PICS) Proforma: A document, in the form of a questionnaire, designed by the protocol specifier or conformance test suite specifier which, when completed for an OSI implementation or system, becomes the PICS.

Protocol Implementation eXtra Information for Testing (PIXIT): A statement made by a supplier or implementor of an IUT which contains or references information (parameter ranges, addressing information, answers to questions about how behavior is invoked in an implementation, as well as all information given in the PICS) related to the IUT and its testing environment, that will enable the test laboratory to run an appropriate test suite against the IUT.

Vendor: A company that either builds OSI products (implementor) and/or provides OSI COTS products to its customers.

6.2 Acronyms and Abbreviations

ACSE	association control service element
AD	addendum
ASE	application service element
ATN	aeronautical telecommunication network
ATS	abstract test suite
BIS	boundary intermediate system
CD	committee draft
CLNP	connectionless network protocol
CONS	connection-oriented network service
COTS	commercial-off-the-shelf
DAD	draft addendum
DAM	draft amendment
DCE	data circuit-terminating equipment
DIS	draft international standard
DTE	data terminal equipment
ES	end system
FAA	Federal Aviation Administration
FIPS	federal information processing standard
FP	full purpose
FTAM	file transfer, access and management
GORD	U.S. GOSIP register database
GOSIP	Government Open Systems Interconnection Profile
IGOSS	Industry/Government Open Systems Specification
IS	intermediate system
IS	international standard
ISO	International Organization for Standardization
IUT	implementation under test
JITC	Joint Interoperability Test Center
LP	limited purpose
MHS	message handling system
MOT	means of test
NAS	National Airspace System
NCSL	NIST Computer Systems Laboratory
NIST	National Institute of Standards and Technology
NISTIR	National Institute of Standards and Technology Interagency Report
OSI	Open Systems Interconnection
PDAM	proposed draft amendment
PICS	protocol implementation conformance statement
PIXIT	protocol implementation eXtra information for testing
ROSE	remote operations service element
TP	transaction processing
VT	virtual terminal
WAN	wide-area network

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APPENDIX I

GOSIP Database

The U.S. GOSIP Register Database (GORD) is an on-line database facility developed by NIST. It provides up-to-date reference information for the GOSIP registers. The GORD contains registers such as the Abstract Test Suite (ATS) Register, the Means of Test (MOT) Register, the Conformance Tested Product register and the PICS Proforma Register.

The GORD can be accessed in two ways:

1. Via Internet Telnet using the Internet address 138.27.7.2 and logging on under the user-name "JITC1." No password is necessary.

2. Via a modem by dialing the phone number (602)538-5004. Log in using the user-name "jitc1." No password is necessary. (The recommended modem configuration is 8-bits, 1 stop bit, no parity, and baud rates of 1200 or 2400 speed.)

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APPENDIX II

Interoperability Test and Registration Services that meet the GOSIP Interoperability Testing provisions are listed here. Entries on this register are provisional.

Register of GOSIP Interoperability Test and Registration Services

ID	Company	Address	Contact
ITRS-1	Osinet	c/o Corporation for Open Systems International 1750 Old Meadow Road Suite 400 McLean, VA 22102 Tel: (703)883-2797	Nancy Pierce, (703)205-2700
	JITC	Box 26, Bldg. 57305 Fort Huachuca Arizona, 85613-7020	Kim March-Force, (602)538-5459 (602)538-4382 (FAX)
ITRS-2	PSI	Process To Support Interoperability (PSI) SPAG, PSI Operator, SPAGsa, Avenue Louise 165, Box 6, B-1050 Brussels, Belgium	(32) 2-645-7811 (32) 2-645-0879 (FAX)

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APPENDIX III

Entries on this register are provisional, valid until December 31, 1994. Currently, no test suite exists for MHS (1988 version).

Register of GOSIP Interoperability Test Suites

Code	Name
ITS-1 X.400 (1984 version)	OSINET, Message Handling Systems Interoperability Tests, Version 1, Edition 2, September 1990, available from: OSINET Corporation, 1750 Old Meadow Road Suite 400, McLean, VA 22102, Tel. (703)883-2797
ITS-2 FTAM	OSINET, FTAM Interoperability Tests, version 1, Edition 2, June 1990, available from: OSINET Corporation, 1750 Old Meadow Road Suite 400, McLean, VA 22102, Tel. (703)883-2797

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APPENDIX IV

Register of OSI Interoperating Products

OSIone Database of Interoperability Results
(Database Listing by Protocol)

OSINET's OSIone Test & Registration (T&R) database contains successful interoperability results between OSI Vendor products. As of 20-FEB-95, the database contains 131 entries from 23 vendors with 107 products (64 FTAM and 41 MHS). Below is a listing of some vendors, their products for FTAM and /or MHS, and the vendor/product that each one successfully tested.

Protocol	Test Parties	Date/Product
FTAM	A: IBM Corporation	Date: 27-Jun-94 AIX OSI Services/6000 Release: Version 1 Release 1.0
	B: Siemens Nixdorf	Date: 27-Jun-94 FTOS-BS2000 V2.0 Release:
FTAM	A: IBM Corporation	Date: 22-Jun-94 AIX OSI Services/6000 Release: Version 1 Release 1.0
	B: Siemens Nixdorf	Date: 22-Jun-94 FTOS-SINIX Release: V2.0
FTAM	A: IBM Corporation	Date: 22-Mar-94 AIX OSI Services/6000 Release: Version 1 Release 1.0
	B: IBM Corporation	Date: 22-Mar-94 OSI/File Services/2 Release: Version 1 Release 1.0
FTAM	A: IBM Corporation	Date: 18-Mar-94 OSI/File Services for MVS and VM Release: Version 1 Release 1.0
	B: Proginet Corporation	Date: 18-Mar-94 Host.FTAM Release: V.1 R.2
FTAM	A: IBM Corporation	Date: 11-Mar-94 AIX OSI Services/6000 Release: Version 1 Release 1.0
	B: IBM Corporation	Date: 11-Mar-94 OSI/File Services for MVS and VM Release: Version 1 Release 1.0

Protocol	Test Parties	Date/Product
FTAM	A: CoCoNet Gmbh	Date: 24-Nov-93 OSILINK FTAM Release: V.2.7.0
	B: Proginet Corporation	Date: 24-Nov-93 Host.FTAM Release: V.1 R.2
FTAM	A: Digital Corporation	Date: 30-Sep-93 DECNET/OSI for ULTRIX V5.1 Release:
	B: IBM Corporation	Date: 30-Sep-93 AIX OSI Services/6000 Release: Version 1 Release 1.0
FTAM	A: Digital Corporation	Date: 29-Sep-93 DECNET-VAX EXTENSIONS V5.4A Release:
	B: IBM Corporation	Date: 29-Sep-93 AIX OSI Services/6000 Release: Version 1 Release 1.0
FTAM	A: Digital Corporation	Date: 31-Aug-93 DECNET/OSI for ULTRIX V5.1 Release:
	B: IBM Corporation	Date: 31-Aug-93 A SERIES OSI-FTAM MARK RELEASE 4.0 Release:
FTAM	A: IBM Corporation	Date: 18-Aug-93 AIX OSI Services/6000 Release: Version 1 Release 1.0
	B: Ing.C. Olivett	Date: 18-Aug-93 UX_FTAM 2.0 Release:
FTAM	A: Bull HN Information	Date: 21-Jun-93 FTAMX 04.00.0007.0000 Release: 04.00.0007.0000
	B: Proginet Corporation	Date: 21-Jun-93 Host.FTAM Release: V.1 R.2

Protocol	Test Parties	Date/Product
FTAM	A: Bull HN Information	Date: 31-Mar-93 FTAMX 3.2.2000.0001 Release: 3.2.2000.0001
	B: Digital Equipment	Date: 31-Mar-93 DECNET/OSI for ULTRIX V5.1 Release:
FTAM	A: Bull HN Information	Date: 02-Mar-93 FTAMX 3.2.2000.0001 Release: 3.2.2000.0001
	B: Tandem Computer	Date: 02-Mar-93 OSI/-FTAM Release: C30
FTAM	A: Bull HN Information	Date: 26-Feb-93 FTAMX 3.2.2000.0001 Release: 3.2.2000.0001
	B: Digital Equipment	Date: 26-Feb-93 DECNET-VAX EXTENSION V5.4A Release:
FTAM	A: IBM Corporation	Date: 24-Feb-93 OSI Messaging and Filing/6000 Release: Version 1 Release 1.0
	B: Ing.C. Olivett	Date: 24-Feb-93 UX_FTAM 2.0 Release:
FTAM	A: IBM Coporation	Date: 22-Feb-93 AIX OSI Services/6000 Release: Version 1 Release 1.0
	B: Tandem Computer	Date: 22-Feb-93 OSI/-FTAM Release: C30
FTAM	A: Digital Equipment	Date: 19-Feb-93 DECNET-VAX EXTENSIONS V5.4A Release:
	B: IBM Corporation	Date: 19-Feb-93 OSI Messaging and Filing/6000 Release: Version 1 Release 1.0

Protocol	Test Parties	Date/Product
FTAM	A: Data General Co.	Date: 01-Feb-93 FTAM for AVIION systems, Revison 3.20 Release:
	B:Digital Equipment	Date: 01-Feb-93 DECNET/OSI for ULTRIX V5.1 Release:
FTAM	A: Digital Equipment	Date: 23-Dec-92 DECNET/OSI for ULTRIX V5.1 Release:
	B: IBM Corporation	Date: 23-Dec-92 OSI Messaging and Filing/6000 Release: Version 1 Release 1.0
FTAM	A: IBM Corporation	Date: 22-Dec-92 OSI File Services/400 Release: Version 2 Release 1.1
	B:Unisys Corporation	Date: 22-Dec-92 2200 OSI-FTAM, Release 2R1B Release:

Protocol	Test Parties	Date/Product
X400	A: Bull HN Information	Date: 29-Apr-93 CX400 Version 01.00.01 Release: 01.00.01
	B: Unisys Corporation	Date: 29-Apr-93 2200 OSI-MHS, Release 3R1 Release:
X400	A: Tandem Computer	Date: 22-Feb-93 OSI-MHS Release: Version C31
	B: Unisys Corporation	Date: 22-Feb-93 A Series OSI-MHS, Release 2.0 Release:
X400	A: Apple Computer	Date: 13-Oct-93 MACX.400 1.0 Release:
	B: Hewlett-Packard	Date: 13-Oct-93 Hp X.400/9000 C.0300 and HP Open Mail A.00.02.03 Release:
X400	A: Bull HN Information	Date: 08-Oct-92 QX400 Version 04.01.08 Release: 04.01.08
	B: Unisys Corporation	Date: 16-Sep-92 A Series OSI-MHS, Release 2.0 Release:
X400	A: Data General Co.	Date: 17-Aug-92 DG AV/X400 fir AVIION systems, Revision 3 Release:
	B: Unisys Corporation	Date: 14-Aug-92 A series OSI-MHS, Mark Release 1.2 Release:
X400	A: Amdahl Corporation	Date: 14-Jul-92 UTS/OSI X400 (84) V1.0 Release:
	B: Unisys Corporation	Date: 22-May-92 2200 OSI-MHS, Release 2R1B Release:

Protocol	Test Parties	Date/Product
X400	A: Sequent Computer	Date: 04-Aug-92 Sequent PTX/X400 Version 1.0 Release:
	B: Tandem Computer	Date: 23-Apr-92 A series OSI-MHS, Release 12.1.654 Release:
X400	A: IBM Corporation	Date: 08-Apr-92 Open Network Distribution services (MVS/VM) Release: Version 1 Release 1.0
	B: Xerox Corporation	Date: 20-Apr-92 FUJI Xerox 8000INS Viewpoint 2.0.6.2 Mail Release:
X400	A: Control Data Systems	Date: 16-Mar-92 CDC Mail/VE Release 1.6.1 Release:
	B: Unisys Corporation	Date: 16-Mar-92 2200 OSI-MHS, Release 2R1B Release:
X400	A: IBM Corporation	Date: 10-Feb-92 Open Network Distribution Services (MVS/VM) Release: Version 1 Release 1.0
	B: Retix	Date: 03-Feb-92 Opensaver 400, Model MH-4410 Version 1.3 Release:
X400	A: Northern Telecom	Date: 08-Feb-92 Carrier400, Stage 1, Release 1.5 Release:
	B: Unisys Corporation	Date: 04-Dec-91 2200 OSI-MHS, Release 2R1A Release:

Protocol	Test Parties	Date/Product
X400	A: Control Data Systems. B: Hewlett Packard	Date: 06-Jun-91 CDC Mail/VE Release 1.6.1 Release: Date: 06-Jun-91 HP X.400/9000 & OpenMail Release:
X400	A: Control Data Systems B: Control Data Systems	Date: 06-Jun-91 CDC MHS/4000 Release 1.4.1 Release: Date: 06-Jun-91 CDC MHS/4000 Release 1.6.1 Release:
X400	A: AT&T B: IBM Corporation	Date: 03-Jun-91 ATTMail Release 4.2 Revision 1 Release: Date: 03-Jun-91 Open Network Distribution Services (MVS/VM) Release: Version 1 Release 1
X400	A: IBM Corporation B: IBM Corporation	Date: 21-Jun-94 AIX OSI Services/6000 Release: Version 1 Release 1.0 Date: 21-Jun-94 OSI Messaging and Filing/6000 Release: Version 1 Release 1.0
X400	A: IBM Corporation B: ICL	Date: 22-Oct-94 AIX OSI Services/6000 Release: Version 1 Release 1.0 Date: 22-Oct-94 OfficePower Ver. 7 Level 2 Release:
X400	A: IBM Corporation B: IBM Corporation	Date: 06-Oct-93 AIX OSI Services/6000 Release: Version 1 Release 1.0 Date: 06-Oct-93 Open Network Distribution Services (MVS/VM) Release: Version 1 Release 1.0

Protocol	Test Parties	Date/Product
X400	A: Unisys Corporation	Date: 20-Sep-93 U series MHS-6000, Release 6.0 Release:
	B: Unisys Corporation	Date: 20-Sep-93 BTOS OSI-MHS Mail system, Release 1.2.0 Release: 1.2.0
X400	A: Bull HN Information	Date: 03-Jun-93 CX400 Version 01.00.01 Release: 01.00.01
	B: Ing.C.Olivett	Date: 03-June-93 IBISys Release: 4.2
X400	A: IBM Corporation	Date: 04-May-93 AIX OSI Services/6000 Release: Version 1 Release 1.0
	B: Unisys Corporation	Date: 04-May-93 U series MHS-6000, Release 6.0 Release:
X400	A: Bull HN Information	Date: 29-Apr-93 CX400 Version 01.00.01 Release: 01.00.01
	B: Unisys Corporation	Date: 29-Apr-93 2200 OSI-MHS, Release 3R1 Release:
X400	A: Tandem Computer	Date: 22-Feb-93 OSI-MHS Release: Version C31
	B: Unisys Corporation	Date: 22-Feb-93 A Series OSI-MHS, Release 2.0 Release:
X400	A: Apple Computer	Date: 13-Oct-93 MACX.400 1.0 Release:
	B: Hewlett-Packard	Date: 13-Oct-93 Hp X.400/9000 C.0300 and HP Open Mail A.00.02.03 Release: